

What is claimed is:

1. An optical module comprises an inlet side optical fiber, an optical filter optically connected to said inlet side optical fiber, and an outlet side optical fiber optically connected to said optical filter,

5 wherein, said optical filter comprises a gain-slope compensation optical filter to flatten a gain slope ($dG/d\lambda$, where G:gain, λ :wavelength) of a gain of an optical amplifier connected to said inlet side optical fiber or said outlet side optical fiber.

10 2. The optical module as claimed in claim 1, wherein said gain-slope compensation optical filter comprises a dielectric multi-layer film filter.

15 3. The optical module as claimed in claim 1, wherein said gain-slope compensation optical filter comprises a long-period fiber grating.

4. The optical module as claimed in claim 1, wherein said gain-slope compensation optical fiber is designed by using a gain-slope evaluation method according to a probe method.

20 5. An optical amplifying module comprises an optical amplifier with the optical module according to claim 1 being optically connected.

25 6. The optical amplifying module as claimed in claim 5, wherein said optical amplifier comprises a rare earth doped optical fiber amplifier.

7. The optical amplifying module as claimed in claim 5 or 6, wherein

an inlet side optical amplifier, an outlet side optical amplifier and one said optical module are included, and said optical module is arranged between said inlet side optical amplifier and said outlet side optical amplifier.

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8. An optical transmission system comprises said optical module of claim 1, an optical amplifier and an optical branching means, wherein FDM (Frequency Division Multiplexing) signal is branched and transmitted.

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9. An optical transmission system comprises said optical module of claim 1, an optical amplifier and an optical branching means, wherein FDM (Frequency Division Multiplexing) signal is further Wavelength Division Multiplexed to be branched and transmitted.

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10. The optical transmission system as claimed in claim 8 or 9, wherein said optical amplifier comprises a rare earth doped optical fiber amplifier.

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11. A method for amplifying frequency modulated optical signal, wherein there are employed an optical amplifying means and a gain-slope compensation means to flatten a gain slope of optical amplifying gain before or after an optical amplifying.

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12. The method as claimed in claim 11, wherein a dielectric multi-layer film filter is used as said gain-slope compensation means.